

Universitas Negeri Surabaya Faculty of Engineering, Building Engineering Education Undergraduate Study Program

Document Code

SEMESTER LEARNING PLAN

Courses		CODE	Course Fam	ily	Cred	lit We	ight	SEMESTER	Compilation Date	
Civil Building	Design	8320504298	Compulsory Program Sul		T=4	P=0	ECTS=6.36	5	February 9, 2022	
AUTHORIZAT	TION	SP Developer	SP Developer Course Cluster Coordinator Study Progra					im		
		Mochamad Firmansyah S.T., M.Sc., M.T. ; Meity S.T., M.T. ; Arie Wardho	Muhammad Imaduddin, S.T., M.T. ; Mochamad Firmansyah Sofianto, S.T., M.Sc., M.T. ; Meity Wulandari, S.T., M.T. ; Arie Wardhono, S.T., M.MT., M.T., Ph.D. dan 1 lainnya		-			Yudha Prawira S.T., M.T.		
Learning model	Case Studies	ase Studies								
Program Learning	PLO study progr	ram that is charged to the	course							
Outcomes	Program Objectives (PO)									
(PLO)	PLO-PO Matrix									
		P.O								
	PO Matrix at the	end of each learning stag	e (Sub-PO)							
		P.0		-	We	ek		<u> </u>		
		1 2 3 4	5 6	7 8	9	10	11 12	13 14	15 16	
Short Course Description	the steel construct planning from the j plates), beams (rin course, the workin according to the pla against internal for beams, columns a requirements calcu application softwar	building planning course is ca tion for the roof (gording, tre profile steel for the top floor, t ng beams, longitudinal and tra ng load planning must be de anning section. For roofs and rces from external loads so t ind foundations used, the thick ulated as well as the reinfor re (SAP and others) and draw is course, the learning model of reports.	estle and wind hen planning of ansverse), colu scribed first so trusses, the sto that the specific kness and cross rcement drawi wing of building	I ties), concret imns a o that eel pro ed pro ss-sect ngs. S g plans	truss te con ind fou the st file us ofile ca ion dir Structu s as w	es (sa structi ructur ed mu an be mension ral ar vell as	addles or jog ion for floor p ons (shallow ral analysis c categorized ons must be nalysis calcul pre-design a	los) and if nec lates (1-way pla and deep found an be calculate d and controlled as safe or not. planned and the ations using the and detailed dra	essary column ates and 2-way dations). In this ed and phased for its capacity For the floors, e reinforcement e help of civil awings with the	
References	Main :									

	 Segui, William T. 2007. Steel Design. Canada: Thomson. McCormac, Jack C. 2008. Structural Steel Design . United States of America: Pearson International Edition. Lam, Dennis, etc. 2004. Structural Steel Work. United States of America: Pearson International Edition. Nawy, Edward G. 1998. Beton Bertulang Suatu Pendekatan Dasar. Bandung: PT. Refika Aditama. Asroni, Ali. 2010. Balok dan Pelat Bertulang. Yogyakarta: Graha Ilmu. Dipohusodo, Istimawan. 1994. Struktur Beton Bertulang . Jakarta: Gramedia Pustaka Utama. Arifi, Eva, etc. 2022. Perencanaan Struktur Baja (berdasarkan SNI 03-1729-2020). Malang: UB Press. Suyono. 2007. Peraturan Pembebanan Indonesia untuk Gedung Anonim. 2020. SNI-03-1729 - Tata Cara Perencanaan Struktur Baja Untuk Bangunan Gedung . Jakarta: DPU. Anonim. 2019. SNI-03-2847 - Tata Cara Perencanaan Ketahanan Gempa Untuk Struktur Bangunan Gedung dan Non Gedung . Jakarta: DPU. Subagio,Triono , etc. 2020. Menggambar dan merencanakan dengan Autocad untuk arsitektur dan Teknik sipil. Jakarta: Cipta Prima Nusantara Anonim. 2020. SNI-03-1727 - Beban Desain Minimum Dan Kriteria Untuk Gedung. Jakarta: DPU. 								
	Supporters:								
Support lecturer	Arie Wardhono, Mochamad Firm	duddin, S.T., M.T. S.T., M.MT., M.T., ansyah Sofianto, S ⁄ono, S.Pd., M.Pd. , S.T., M.T.	S.T., M.Sc., M.T.						
Week-	Final abilities of each learning	Eva	aluation	Lea Stude	lelp Learning, Irning methods, ent Assignments, Estimated time]	Learning materials Assessmen			
	stage (Sub-PO)	Indicator	Criteria & Form	Offline(offline)	Online (<i>online</i>)	[References]	Weight (%)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
1	Students are able to design civil building planning drawings	- Describe the floor plan of a multi-storey building Provide clear information on the function of buildings and rooms Describe the roof plan plan. - Describe floor plans, beams and columns Describe the cross-section and longitudinal sections of the building.	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50		Material: Civil building planning drawings References: Subagio, Triono, etc. 2020. Drawing and planning with Autocard for architecture and civil engineering. Jakarta: Cipta Prima Nusantara	5%		
2	Students are able to design civil building planning drawings	- Describes the longitudinal and cross sections of the building.	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50		Material: Design of civil building planning drawings References: Subagio, Triono, etc. 2020. Drawing and planning with Autocard for architecture and civil engineering. Jakarta: Cipta Prima Nusantara	5%		

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3	Students are able to calculate the load from the roof for planning curtains, handlebars and wind ties and control capacity for safe conditions.	- Create a preliminary design for a building consisting of steel and concrete elements	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50	Material: Steel roof planning Reference: McCormac, Jack C. 2008. Structural Steel Design. United States of America: Pearson International Edition. Material: Steel roof	5%
					Steel roof planning Reference: Lam, Dennis, etc. 2004. Structural Steel Work. United States of America: Pearson International Edition.	
					Material: Roof loading Reference: Anonymous. 2020. SNI- 03-1727 - Minimum Design Loads and Criteria for Buildings. Jakarta: DPU.	
					Material: Roof loading Reference: Suyono. 2007. Indonesian Loading Regulations for Buildings	
4	Students are able to calculate the truss planning loads and calculate rod forces.	- Describes the load that works from the roof to the trusses Calculate the amount of load acting at each truss node Create a structural model in a structural	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	- Group discussion - Case study 4 X 50	Material: Calculation of truss roofs Reference: Segui, William T. 2007. Steel Design. Canada: Thomson.	0%
		analysis program using a computer Operate computer programs to model stance, input loads and obtain support reactions and bar forces.			Material: Calculation of truss roofs Reference: McCormac, Jack C. 2008. Structural Steel Design. United States of America: Pearson International Edition.	
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6	Students are able	- Planning the	Criteria	- Group	Material:	50%
	Students are able to plan the dimensions of plates, beams and columns.	- Planning the loading requirements for each room Calculating the tributary area on beams and columns Calculating the loading on the portal Calculating the load distribution on each level for equivalent static earthquake loading.	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50	Material: Dimensional planning for plates, beams and columns. References: Nawy, Edward G. 1998. Reinforced Concrete A Basic Approach. Bandung: PT. Refika Aditama. Material:	5%
					Dimensional planning for plates, beams and columns. References: Asroni, Ali. 2010. Reinforced Beams and Plates. Yogyakarta: Graha Ilmu.	
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					Material: Dimensional planning for plates, beams and columns. Reader: Dipohusodo, Istimawan. 1994. Reinforced Concrete Structures. Jakarta: Gramedia Pustaka Utama.	
7	Students are able to calculate slab reinforcement plans for both 1- way slabs and 2- way slabs.	- Planning the load calculation on the plate Calculate moment analysis on plates in either 1 directions or 2 directions Calculating slab reinforcement in both 1 and 2 directions	Criteria: Perfect score if answered correctly Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50	Material: Plate reinforcement planning References: Nawy, Edward G. 1998. Reinforced Concrete A Basic Approach. Bandung: PT. Refika Aditama. Material: Plate	10%

8	Students are able	- Plan the			reinforcement planning Reference: Asroni, Ali. 2010. Reinforced Beams and Plates. Yogyakarta: Graha Ilmu. Material: Plate reinforcement planning Reference: Dipohusodo, Istimawan. 1994. Reinforced Concrete Structures. Jakarta: Gramedia Pustaka Utama. Material: Plate loading planning Reference: Suyono. 2007. Indonesian Loading Regulations for Buildings for Buildings. Jakarta: OasJIT27 - Minimum Design Loads and Criteria for Buildings. Jakarta: DPU. Material: Plate planning Reference: Anonymous. 2020. SNI- 03-1727 - Minimum Design Loads and Criteria for Buildings. Jakarta: DPU. Material: Plate reinforcement planning Reference: Anonymous. 2019. SNI- 03-2847 - Procedures for Calculating Concrete Structures for Buildings. Jakarta: DPU.	10%
	for reinforcing stairs and landings.	thickness of the stair plate and landing, the width of the steps and the height of the steps Planning load calculations on stairs Calculating moment analysis on the ladder mechanics model Calculate the	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50	Material: Calculation of reinforcement for stair structures Reference: Nawy, Edward G. 1998. Reinforced Concrete A Basic Approach. Bandung: PT. Refika Aditama.	1070

need for stair reinforcement		Material: Calculation of reinforcement for stair structures. Reference: Asroni, Ali. 2010. Reinforced Beams and Plates. Yogyakarta: Graha Ilmu.	
		Material: Calculation of reinforcement for stair structures. Reference: Dipohusodo, Istimawan. 1994. Reinforced Concrete Structures. Jakarta: Gramedia Pustaka Utama.	
		Material: Stair structure loading Reader: Suyono. 2007. Indonesian Loading Regulations for Buildings	
		Material: Stair structure loading Reference: Anonymous. 2020. SNI- 03-1727 - Minimum Design Loads and Criteria for Buildings. Jakarta: DPU.	
		Material: Calculation of reinforcement for stair structures. Reference: Anonymous. 2019. SNI- 03-2847 - Procedures for Calculating Concrete Structures for Buildings. Jakarta: DPU.	

9	Students are able to calculate earthquake planning for a predetermined area.	- Calculate the total weight of each floor and add up the total floor load Calculate the basic earthquake coefficient for the response- spectra or vibration time so that the earthquake force value can be calculated Calculate the distribution of earthquakes to each floor.	Criteria: Perfect score if answered correctly Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50	Material: Earthquake load calculations Reference: Anonymous. 2019. SNI- 1726 - Procedures for Earthquake Resistance Planning for Building and Non-Building Structures. Jakarta: DPU.	10%
10	Students are able to determine the portal that will be calculated with the help of the SAP 2000 program.	- Create a portal model according to plans and drawings Provide completeness for the portal model Input load on portal model Carry out program analysis and issue analysis results from the SAP program.	Criteria: Perfect score if answered correctly Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50		5%

12	Students are able	- Determine	Criteria:	- Group	Material:	10%
	to calculate cross	the maximum	Qualitative	discussion	Cross Beam	10/0
	beam	field moment	L	- Case	Calculations	
	reinforcement	and maximum	Forms of	study	References:	
	plans.	support	Assessment :	4 X 50	Nawy,	
		moment on 1	Participatory	47.50	Edward G.	
		beam Calculate	Activities, Project		1998.	
		reinforcement	Results		Reinforced	
		requirements	Assessment /		Concrete A	
		and determine	Product		Basic	
		the	Assessment,			
		reinforcement	Portfolio		Approach.	
		to be	Assessment		Bandung:	
		installed	Assessment		PT. Refika	
		Create reinforcement			Aditama.	
		calculation			P	
		tables for			Material:	
		other beam			Cross Beam	
		conditions.			Calculations	
					References:	
					Asroni, Ali.	
					2010.	
					Reinforced	
					Beams and	
					Plates.	
					Yogyakarta:	
					Graha Ilmu.	
					Material:	
					Cross Beam	
					Calculations	
					Reference:	
					Dipohusodo,	
					Istimawan.	
					1994.	
					Reinforced	
					Concrete	
					Structures.	
					Jakarta:	
					Gramedia	
					Pustaka	
					Utama.	
					Material:	
					Cross Beam	
					Calculations	
					Reference:	
					Anonymous.	
					2019. SNI-	
					03-2847 -	
					Procedures	
					for	
					Calculating	
					Concrete	
					Structures for	
					Buildings.	
					Jakarta:	
		1	1	1	DPU.	

13	Students are able to calculate column reinforcement plans.	- Determine P(axial) and Moment (maximum) in 1 column Calculate the condition of the column, whether it is a short column with eccentricity or a slender column so that the moment increase can be calculated. - Determine the column reinforcement ratio based on the Pn and Mn interaction diagram.	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50	Material: Column structure calculations References: Nawy, Edward G. 1998. Reinforced Concrete A Basic Approach. Bandung: PT. Refika Aditama. Material: Column structure calculations References: Asroni, Ali. 2010. Reinforced Beams and Plates. Yogyakarta: Graha Ilmu. Material: Column structure calculations Reference: Dipohusodo, Istimawan. 1994. Reinforced Concrete Structures. Jakarta: Gramedia Pustaka Utama. Material: Column structure calculations Reference: Dipohusodo, Istimawan. 1994. Reinforced Concrete Structures. Jakarta: Gramedia Pustaka Utama. Material: Column structure calculations Reference: Jistimawan. 1994. Reinforced Concrete Structures. Jakarta: Gramedia Pustaka Utama.	10%
14	Students are able to calculate foundation, roof, and sloof plans and reinforcement.	- Planning the size of the foundation based on the allowable soil stress Calculate the capacity of the foundation against shear. - Calculating mechanical analysis of the foundation to obtain moments Calculating flexible reinforcement for foundations Calculating poer and sloof.	Criteria: Qualitative Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	- Group discussion - Case study 4 X 50		5%

15	Students are able to draw details for trusses and connections, plate reinforcement, beams and columns	- Planning the size of the foundation based on the allowable soil stress Calculate the capacity of the foundation against shear. - Calculating mechanical analysis of the foundation to obtain moments Calculating flexible reinforcement for foundations Calculating poer and sloof.	Assessment / Product	- Group discussion - Case study 4 X 50		10%
16						0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	33.34%
2.	Project Results Assessment / Product Assessment	33.34%
3.	Portfolio Assessment	33.34%
		100%

Notes

- 1. Learning Outcomes of Study Program Graduates (PLO Study Program) are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- 2. The PLO imposed on courses are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- 3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- 4. Subject Sub-PO (Sub-PO) is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- 5. Indicators for assessing abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
- 6. Assessment Criteria are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
- 7. Forms of assessment: test and non-test.
- 8. Forms of learning: Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
- 9. Learning Methods: Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
- 10. Learning materials are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 11. The assessment weight is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
- 12. TM=Face to face, PT=Structured assignments, BM=Independent study.